

CLAIM AMENDMENT

Please amend the claims in accordance with the following listing:

Listing of Claims

Claims 1-18. (Canceled).

19. (New): A method of compressing a scene graph in a multi-media presentation, the method comprising:

ordering graph nodes of a plurality of nodes in the scene graph in a first direction to obtain ordered graph nodes;

selecting one or more ranges of quantization values for one or more quantization types of the ordered graph nodes;

traversing the ordered graph nodes in a second direction, the second direction being a reverse of the first direction, wherein the step of traversing comprises determining, for each traversed ordered graph node that has a successive sibling node lying in the second direction, whether to insert a quantization parameter node immediately following said each traversed ordered node, each quantization parameter node being capable of affecting compression of ordered nodes lying in the first direction from said each quantization parameter node; and

inserting the quantization node between said each traversed ordered graph node and the successive sibling node lying in the second direction in response to the step of determining.

20. (New): The method of compressing according to claim 19, wherein the step of determining comprises comparing costs of inserting a single quantization parameter node controlling compression of the successive sibling node and of said each traversed ordered graph node to the cost of inserting separate quantization parameter nodes to control compression of the successive sibling node and of said each traversed ordered graph node.

21. (New): The method of compressing according to claim 20, wherein the step of comparing comprises:

calculating a first cost of inserting a first quantization parameter node between said each traversed ordered graph node and the successive sibling node lying in the second direction, the first quantization parameter node controlling compression of said each traversed ordered graph node;

calculating a second cost of inserting a second quantization parameter node lying immediately adjacent to the successive sibling node in the second direction, the second quantization parameter node controlling compression of the successive sibling node while the first quantization parameter node controls compression of said each traversed ordered graph node; and

calculating a third cost of inserting a third quantization parameter node lying immediately adjacent to the successive sibling node in the second direction, the third quantization parameter node controlling compression of the successive sibling node and of said each traversed ordered graph node.

22. (New): The method of compressing according to claim 21, wherein the step of comparing further comprises:

summing the first cost and the second cost to obtain a combined cost; and

deciding whether the third cost is greater than the combined cost.

23. (New): The method of compressing according to claim 22, wherein the step of inserting is performed when the third cost is greater than the combined cost.

24. (New): The method of compressing according to claim 23, wherein the one or more quantization types comprise a quantization type affecting object position.

25. (New): The method of compressing according to claim 23, wherein the one or more quantization types comprise a quantization type affecting object size.

26. (New): The method of compressing according to claim 23, wherein the one or more quantization types comprise a quantization type affecting color and intensity.

27. (New): The method of compressing according to claim 23, wherein the one or more quantization types comprise a quantization type affecting scale in transformation.

28. (New): The method of compressing according to claim 23, wherein the one or more

quantization types comprise a quantization type affecting angles.

29. (New): Apparatus for compressing a scene graph in a multi-media presentation, the apparatus comprising a memory storing computer instructions and a processor coupled to the memory, the processor being capable of executing the instructions, wherein the instructions, when executed by the processor, cause the processor to perform the following steps:

ordering graph nodes of a plurality of nodes in the scene graph in a first direction to obtain ordered graph nodes;

selecting one or more ranges of quantization values for one or more quantization types of the ordered graph nodes;

traversing the ordered graph nodes in a second direction, the second direction being a reverse of the first direction, wherein the step of traversing comprises determining, for each traversed ordered graph node that has a successive sibling node lying in the second direction, whether to insert a quantization parameter node immediately following said each traversed ordered node, each quantization parameter node being capable of affecting compression of ordered nodes lying in the first direction from said each quantization parameter node; and

inserting the quantization node between said each traversed ordered graph node and the successive sibling node lying in the second direction in response to the step of determining.

30. (New): The apparatus according to claim 29, wherein the instructions, when executed by the processor, cause the processor, in the course of performing the step of determining, to

compare costs of inserting a single quantization parameter node controlling compression of the successive sibling node and of said each traversed ordered graph node to the cost of inserting separate quantization parameter nodes to control compression of the successive sibling node and of said each traversed ordered graph node.

31. (New): The apparatus according to claim 30, wherein the instructions, when executed by the processor, cause the processor, in the course of performing the step of comparing, to:

calculate a first cost of inserting a first quantization parameter node between said each traversed ordered graph node and the successive sibling node lying in the second direction, the first quantization parameter node controlling compression of said each traversed ordered graph node;

calculate a second cost of inserting a second quantization parameter node lying immediately adjacent to the successive sibling node in the second direction, the second quantization parameter node controlling compression of the successive sibling node while the first quantization parameter node controls compression of said each traversed ordered graph node; and

calculate a third cost of inserting a third quantization parameter node lying immediately adjacent to the successive sibling node in the second direction, the third quantization parameter node controlling compression of the successive sibling node and of said each traversed ordered graph node.

32. (New): The apparatus according to claim 31, wherein the instructions, when executed by the processor, cause the processor, in the course of performing the step of comparing, to:

sum the first cost and the second cost to obtain a combined cost; and

decide whether the third cost is greater than the combined cost.

33. (New): The apparatus according to claim 32, wherein the instructions, when executed by the processor, cause the processor to insert the quantization node between said each traversed ordered graph node and the successive sibling node lying in the second direction when the third cost is greater than the combined cost.

34. (New): The apparatus according to claim 33, wherein the instructions, when executed by the processor, cause the processor, in the course of performing the step of selecting, to select the one or more ranges of quantization values for a quantization type affecting object position.

35. (New): The apparatus according to claim 33, wherein the instructions, when executed by the processor, cause the processor, in the course of performing the step of selecting, to select the one or more ranges of quantization values for a quantization type affecting object size.

36. (New): The apparatus according to claim 33, wherein the instructions, when executed by the processor, cause the processor, in the course of performing the step of selecting, to select the one or more ranges of quantization values for a quantization type affecting color and intensity.

37. (New): The apparatus according to claim 33, wherein the instructions, when executed

by the processor, cause the processor, in the course of performing the step of selecting, to select the one or more ranges of quantization values for a quantization type affecting scale in transformation.

38. (New): The apparatus according to claim 33, wherein the instructions, when executed by the processor, cause the processor, in the course of performing the step of selecting, to select the one or more ranges of quantization values for a quantization type affecting angles.